

REMARKS

Claims 1 through 34 remain in the application. Claims 3, 8, 14 and 26 are now rewritten in independent form and should be allowable. Various other minor amendments were made to other claims to correct errors noted by the Examiner and for other reasons stated in more detail below.

Objection to the Specification

The disclosure was objected to because of an informal error in a reference numeral on page 9 at line 2. The foregoing amendment to the specification corrects this error.

Claim Objections

Claim 32 was objected to as being dependent upon itself. With entry of the foregoing amendment, claim 32 now depends from claim 31. An amendment has been made to claim 33 so that it also depends from claim 31. That is, both claims 32 and 33 further define the nature of the data link layer address.

Claim Rejections Under 35 U.S.C. §112

Claims 1 and 3 were rejected under 35 U.S.C. §112, second paragraph as failing to particularly point out and distinctly claim the subject matter of the invention.

For claim 1, the Examiner was concerned that it was unclear where the virtual network address was assigned. With entry of the foregoing amendment, the reference to the virtual network address has been changed to properly refer to it being assigned to a virtual network device. As explained in the specification, a virtual device driver 150 is created for physical trunks 124 by allocating a virtual NIC device structure. A trunk configuration routine sets an owner field 202 in each of the respective physical NIC device structures associated with each physical network device port 136 to indicate membership in various groups or “trunks”.

For example, in Fig. 4, physical NIC device structures 400 are allocated for network device ports 136 which are members of the same trunk 124. As described in the specification in connection with the description of Fig. 4, beginning at page 14, line 24 and continuing through

page 15 line 9, NIC device structures 400-0...400-5 are allocated for their respective physical network device ports 136-0...136-5. A virtual NIC device structure 402-0 is also allocated for the trunk 124-0 associated with servicing physical network device ports 136-1, 136-2, 136-4 and 136-5. The invention thus has “device structures” 400 allocated to physical communication ports as well as “virtual device structures” 402 allocated for virtual network devices. The virtual network devices consist of groups of physical ports.

In claim 1, the network address for the physical communication port and a virtual network address assigned to the virtual network device are thus both set to the trunk address.

Claim 3 has also been amended to indicate that the device structure referenced at line 2 is the virtual device structure. The device structure referenced in line 3 of claim 3 is the device structure allocated to the physical communication ports.

Claim Rejections Under 35 U.S.C. §102

Claims 1, 2, 12, 13, 24-25 were rejected under 35 U.S.C. §102 (e) as being anticipated by Gai *et al.*, U.S. Patent 6,678,241.

The present invention relates to a technique for communication in a data processing system, such as a network file server, having a number of physical communication ports. According to one aspect of the present invention, device structures are allocated for each of the physical ports in the system such as in a Network Interface Card (NIC). A virtual device structure is also allocated. The physical device structures contain a pointer to a corresponding virtual device structure. In this manner, when any of the physical communication ports in a group or trunk receive a data packet, the data packet is first forwarded to the virtual network device. Information in the virtual network device then allows routing of the packet to the correct destination physical port. This can happen because both a virtual network device structure (e.g., such as NICdevice __VDI 402-0 shown in Fig. 4) and a physical device structure (e.g., such as NICdevice __P0,...NIC device __P5, 400-0,...400-5) are maintained.

The Gai patent describes a switch 230 that includes a number of ports 302, each of which can be configured either as an access port or a trunk port. According to Gai, an access port is a port that does not provide connectivity to other ports of a bridged network. For example, access ports are directly connected to a LAN end station, server, workstation or the like. A trunk port,

according to Gai, corresponds to a point-to-point link providing connectivity from the switch 230 to other areas of a bridged network 200.

Applicants' "trunks" thus include a plurality of Gai's "access ports". Thus, Applicants' "trunks" mean something different from Gai's "trunks". Gai thus does not contemplate Applicants' situation where a virtual device or trunk address designation is used to refer to several physical ports.

Gai does admittedly maintain a table 510 as shown in his Fig. 5C. As he describes beginning at column 12, line 25 the table 510 identifies each of a number of logical Virtual Local Area Networks (VLANs) of which the switch 230 is aware. The "color mapping" is thus from logical VLANs to physical VLANs. For example, a "red" logical VLAN is associated with "violet", "purple", "magenta" and "orange" physical VLANs. Thus the table in Gai's maintaining a relationship between logical and physical VLANs. But Gai's table is maintained at the LAN level only and is not a device level structure, as is Applicants' virtual device.

Representative claim 1 of Applicants' invention recites, in contrast:

A method implemented in a network file server for providing a trunk, the trunk including
a plurality of communications ports comprising the steps of:
assigning ownership of the plurality of communications ports
coupled to a switch to a *virtual network device*;
setting a trunk network address to a first network address assigned
to a first communications port;
setting network addresses for the plurality of communications ports
and a *virtual network address assigned to the virtual network device* to the
trunk network address; and
upon receiving a data packet for the trunk network address by any
of the communications ports in the trunk, *forwarding the data packet to
the virtual network device*.

In other words, Applicants respectfully submit that Gai neither suggests their claimed (a) *virtual network device*, nor their claimed step of (b) upon receiving a data packet for a trunk network address, *forwarding the data packet to a virtual network device*.

Gai's table 510 maintained by his switch 230 is simply a correspondence of physical LAN to virtual to LAN. This is not the same thing as Applicants' device level virtual device definitions. As shown in Fig. 4, a virtual device structure such as NICdevice __ VDI 402-0 is allocated to represent a group of physical NICdevices 400-0...400-5.

There is also no mention in Gai of forwarding data packets to a virtual network device upon their receipt at a network device port.

Claim 1 is thus patentable.

The other independent claims 23 and 24 are patentable for the same reasons

At paragraph 8 of the Office Action, claims 5, 16, and 28 were also rejected as being under 35 U.S.C. §103 (a) as being unpatentable over Gai in further view of Sugihara, U.S. Patent 6,385,197.

Sugihara also fails to suggest both the claimed virtual device, and the claimed mapping of physical network addresses to virtual network devices.

Allowed Claims

At paragraph 9 of the Office Action, claims 3-4, 6-11, 14-15, 17-22, 26-27, and 29-34 were indicated as being allowable if rewritten in independent form.

With entry of the foregoing amendment, claim 3 is now rewritten in independent form. Claims 3 and 4 should thus now be allowed.

Claim 8 has also been rewritten in independent form, and claims 8-11 are now allowable.

Likewise, claim 14 has been rewritten in independent form. Claims 16 and 19 now also depend from claim 14. Thus, all of claims 14-22 should also be in condition for allowance.


Similarly, claim 26 has been rewritten in independent form, and claims 28 and 31 have been amended to depend from claim 26. Thus, claims 26-34 should also be in condition for allowance.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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